

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Canceled).

1 Claim 2 (Currently Amended): A micro-bubble generating system, comprising a container
2 main unit having an interior space of frusto-conical shape and being closed at one end, a pressurized
3 liquid inlet opening communicating tangentially with said interior space, a gas introducing hole
4 opening at one end of said frusto-conical space to generate a swirling gas that is ~~forcibly cut off and~~
5 ~~smashed by direct impingement by~~ exposed to contact with swirling pressurized liquid introduced
6 through said liquid inlet, and a swirling gas-liquid mixture outlet opening at the other end of said
7 interior space and operative to discharge micro-bubbles therefrom, said interior space having a
8 largest bore diameter substantially equal to a bore diameter of said gas-liquid mixture outlet opening.

1 Claim 3 (Previously Presented): A micro-bubble generating system according to one of
2 claims 2 or 10, wherein a plurality of pressurized liquid inlet openings are tangentially disposed on
3 a part of a circumferential surface of the container and communicate at spaced locations about the
4 circumference of the container wall with the interior space.

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1 Claim 4 (Previously Presented): A micro-bubble generating system according to one of
2 claims 2 or 10, wherein said pressurized liquid inlet opening opens on a part of the circumferential
3 surface of the container near said gas-mixture outlet from said interior space.

 Claim 5 (Canceled).

1 Claim 6 (Withdrawn): A micro-bubble generating system according to one of claims 1 or
2 2, wherein a baffle plate is arranged closely spaced from the swirling gas-liquid mixture outlet from
3 the interior space.

1 Claim 7 (Withdrawn): A micro-bubble generating system according to one of claims 1 or
2 2, wherein a partition plate for closing the outlet is attached, leaving only a partial opening defining
3 the swirling gas-liquid mixture outlet from the interior space.

1 Claim 8 (Currently Amended): A method for micro-bubble generation, using a micro-bubble
2 generating system, which comprises a container main unit having an interior space with a bottom,
3 a pressurized liquid inlet opened in a tangential direction on a part of a circumferential surface of an
4 inner wall of the space, a gas introducing hole opened at the bottom of the interior
5 space, and a swirling gas-liquid mixture outlet opened at a mixture discharge end of the interior

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6 space, whereby said method comprising the steps of:

7 forming a swirling gas cavity along which self-sucked gas is swirled and guided while
8 flowing in a narrow stream of swirling gas flow in the interior space; and

9 generating micro-bubbles by forcibly cutting off and smashing the swirling gas cavity by
10 contact with swirling pressurized liquid due to generate a difference of swirling velocity between the
11 gas and liquid portions in the swirling gas cavity, said interior space having a largest bore diameter
12 substantially equal to a bore diameter of said gas-liquid mixture outlet.

1 Claim 9 (Currently Amended): A method for micro-bubble generation, using a micro-bubble
2 generating system, which comprises a container main unit having an interior space with a bottom,
3 a pressurized liquid inlet opened in a tangential direction on a part of a circumferential surface of an
4 inner wall of the space, a gas introducing hole opened at the bottom of the interior space, and a
5 swirling gas-liquid mixture outlet opened at a mixture discharge end of the interior space, whereby
6 said method comprising the steps of:

7 forming a swirling gas cavity for swirling and guiding self-sucked gas along a narrow gas
8 flow stream in the interior space;

9 generating micro-bubbles by forcibly cutting off and ~~directly impinging~~ smashing the
10 swirling gas cavity by contact with swirling pressurized liquid due to generate a difference of
11 swirling velocity between the portions in the swirling gas cavity; and

12 continuously cutting off and smashing the swirling gas cavity in said interior space due to

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13 ~~generate~~ a relative increase of the difference in rotating velocity between a rotating cut-off portion
14 and ~~impinged~~ smashing portion in the ~~second~~ step of generating micro-bubbles, the liquid passing
15 through the rotating cut-off portion of gas cavity being rapidly diffused while the diffused rotating
16 gas fluid mixture is stably formed and an angle of diffusion of the rotating mixture is large, and
17 wherein a difference of rotating velocity between gas and liquid streams is relatively increased
18 between the rotating cut-off portion and the smashing ~~impinged~~ portion of the swirling gas cavity
19 portion, said interior space having a largest bore diameter substantially equal to a bore diameter of
20 said gas-liquid mixture outlet.

1 Claim 10 (Currently Amended): A micro-bubble generating system, comprising:
2 a container having an interior space defined by a surface of revolution,
3 a container bottom closing said space at one axial end thereof and a gas-liquid mixture outlet
4 opening at the other end thereof, said interior space having a largest bore diameter substantially equal
5 to a bore diameter of said gas-liquid mixture outlet opening,
6 a liquid inlet opening communicating tangentially with said interior space adjacent said gas-
7 liquid mixture outlet opening,
8 means for injecting pressurized liquid through said liquid inlet opening as a centrifugally
9 flowing fluid into said interior space,
10 a gas introducing hole disposed in the container bottom and operative to introduce gas into
11 said interior space, said stream of gas being induced to swirl as a narrow low pressure flow stream

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12 in said interior space by said centrifugally flowing liquid,

13 wherein said swirling pressurized liquid introduced through said pressurized liquid inlet
14 ~~directly impinges on~~ contacts said narrow swirling gas flow stream adjacent said gas-liquid mixture
15 outlet to tear down said swirling gas flow stream and thereby generate micro-bubbles for discharge
16 from said gas-liquid mixture outlet opening.

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